

WHAT IS CLAIMED IS:

1. A method for preparing phosphors comprising the steps of:

- (a) providing a solution comprising an alkoxide precursor and a dopant precursor;
- (b) mixing said solution with a solid particle precursor;
- (c) inducing a sol-gel condensation reaction to form a sol-gel condensation reaction mixture;
- (d) drying the sol-gel condensation reaction mixture; and
- (e) firing the dried reaction mixture at a temperature sufficient to form phosphors.

2. The method according to claim 1, wherein said solution further comprises a hydrolysis agent.

3. The method according to claim 1, wherein a hydrolysis agent is added after said step (b).

4. The method according to claim 3, wherein said hydrolysis agent is added immediately before step (c).

1 5. The method according to claim 1, wherein said solution further comprises
2 a reagent capable of inhibiting condensation reactions before step (b) (stabilizing
3 agent) in said solution.

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5 6. The method according to claim 1, wherein said solid particle precursor
6 have an average particle size of from about 2 to about 10,000 nm.

7 7. The method according to claim 2, wherein said hydrolysis agent is selected
8 from the group consisting of water.

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10 8. The method according to claim 3, wherein said hydrolysis agent is selected
11 from the group consisting of water, tetramethylammonium hydroxide, and mixtures
12 thereof.

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15 9. The method according to claim 1, wherein said dopant precursor is an
16 alkoxide, an acetate, an organometallic compound, an inorganic salt, or mixtures
17 thereof.

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19 10. The method according to claim 1, wherein said solid particle precursor is
20 silica, metal oxide, metal sulfide, metal oxysulfide, metal halide, metal carbonate,

1 metal phosphate, metal sulfate, semiconductor-oxide, pure metal or mixtures
2 thereof.

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4 11. The method according to claim 10, wherein said solid particle precursor
5 is fumed silica.

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7 12. A phosphor product obtained from the process according to claim 1.

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9 13. The phosphor product according to claim 12, wherein said product is
10 included in a TV screen, a field emission display, a plasma display, a phosphor
11 screen, a phosphor component for an electroluminescence display, a field emission
12 or plasma display that does not have a conventional screen (i.e., luminescent
13 components built into or on a substrate), an x-ray imaging display, or a detector for
14 x-ray or charged particles.

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16 14. A phosphor product according to claim 12, wherein the
17 cathodoluminescence of said phosphor product increases substantially in a linear
18 fashion with increasing voltage.

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20 15. The phosphor product according to claim 14, wherein said product is

1 included in a TV screen, a field emission display, a plasma display, a phosphor
2 screen, a phosphor component for an electroluminescence display, a field emission
3 or plasma display that does not have a conventional screen (i.e., luminescent
4 components built into or on a substrate), an x-ray imaging display, or a detector for
5 x-ray or charged particles.

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7 16. A phosphor product according to claim 14, wherein the
8 cathodoluminescence of said product increases substantially in a linear fashion at
9 increasing voltages between 2.0 kV and 3.5 kV.
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11 17. The phosphor product according to claim 16, wherein said product is
12 included in a TV screen, a field emission display, a plasma display, a phosphor
13 screen, a phosphor component for an electroluminescence display, a field emission
14 or plasma display that does not have a conventional screen (i.e., luminescent
15 components built into or on a substrate), an x-ray imaging display, or a detector for
16 x-ray or charged particles.
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